

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-2 (canceled).

Claim 3 (new): A current direction detection circuit for detecting a reverse flow of current in a ground side output transistor, through which current flows from a grounded input terminal to an output terminal, comprising:

 a monitoring transistor having a control terminal and an output terminal arranged to be connected, respectively, with a control terminal and an output terminal of the ground side output transistor;

 an impedance element having one terminal connected with the input terminal of the monitoring transistor and the other terminal grounded;

 first and second constant-current sources;

 a diode-connected reference transistor arranged between the first constant-current source and ground potential; and

 a sensing transistor arranged between the second constant-current source and the impedance element, the sensing transistor having a control terminal connected with a control terminal of the reference transistor; wherein

 a voltage between the second constant-current source and the sensing transistor is output as a control signal to control the ground side output transistor and monitoring transistor.

Claim 4 (new): A switching regulator comprising:

 a power source side output transistor and a ground side output transistor
provided in series between an input power source and ground potential;

 a smoothing circuit having an input terminal connected between the power
source side output transistor and the ground side output transistor and an output
terminal connected with a switching regulator output terminal that outputs a
predetermined DC voltage;

 a regulator control circuit that performs on/off control of the power source side
output transistor and ground side output transistor so as to maintain a predetermined
DC voltage by inputting as feedback the voltage of the switching regulator output
terminal;

 the current direction detection circuit according to claim 3; and

 a ground side output transistor control circuit arranged to control the ground side
output transistor so as to maintain the ground side output transistor turned off once the
control signal of the current direction detection circuit has risen, after being turned on by
the control signal of the regulator control circuit.